

Taxonomical Review of *Perinereis aibuhitensis* Grube, 1878 (Nereidae: Polychaeta) in Korea

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두토막눈썹참갯지렁이 (참갯지렁이과 : 갯지렁이강)에 대한 분류학적인 검토

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적 요

두토막눈썹참갯지렁이 *Perinereis aibuhitensis*는 분류특징인 입주머니 (proboscis)의 이빨 (paragnath)에 변이가 많아 국내에서는 *Perinereis vancaurica tetradentata* 또는 *Neanthes virens* 등으로 잘못 알려져 왔다. 이에 한국 서해안 3곳 (인천, 서산, 목포)에서 채집된 약 50개체로 분류검토하여 본 종의 학명이 *P. aibuhitensis*임을 밝히고, 아울러 성숙산란형 (heteronereid)에 대한 기재를 추가하였다.

Key words: Polychaeta, *Perinereis aibuhitensis*, heteronereid, intertidal, Korea.

INTRODUCTION

The nereid worms of Korean waters have been studied mainly by Paik (1977). The nereid worms occurred in Korean coastal areas were recognized for 33 species in 13 genera. Among them, a few species in the genus *Perinereis* have been extensively exploited by fisherwomen because they are suitable for a sea-bait for fishing sports.

Their feeding mode is known as a surface deposit feeder, and so the sediment reworking rate by their feeding activity may be high, which is very important to the natural purification of the excess organic matter in the coastal ecosystem. Despite its importance in ecology and fishery, *Perinereis aibuhitensis* Grube, 1878 was frequently mis-identified or mis-recorded as other species like *P. vancaurica tetrudentata* and *Neant hes virens*.

In this paper we re-examined the taxonomical status of this species, and described some characteristics of epitokous forms together with their biogeographical distribution.

MATERIALS AND METHODS

Specimens were collected from three intertidal areas in the western coast of Korea: Mokpo, Chungwhang-ri in Sosan, and Incheon area from August, 1989 to September, 1990 (Fig. 1). All worms were anesthetized by 7% magnesium chloride solution and fixed with 10% neutralized formalin solution. Heteronereids were available from the specimens reared in the room culture bath at KORDI for 6 months.

SYSTEMATIC ACCOUNT

Class Polychaeta

Order Phyllodocida

Superfamily Nereididae

Family Nereidae Johnston, 1865.

Genus *Perinereis* Kinberg, 1866.

Perinereis aibuhitensis Grube, 1878.

Nereis (Perinereis) aibuhitensis Grube, 1878 (p.89-91. Taf. 5, Fig. 3). *Nereis (Neanthes) linea* Treadwell, 1936 (p. 268-270, Fig. 19a-d). *Nereis (Neanthes) orientalis* Treadwell, 1936 (p.270-272, Fig. 19f-i). *Perinereis aibuhitensis*, Fauvel, 1953 (p.209-210, Fig. 107a); Wu, Sun & Yang, 1985 (p.189-193, Figs. 107-109).

Perinereis vancaurica tetrudentata Imajima, 1972 (p. 86-88, Fig. 23); Paik, 1975 (p.7, pl. 6, Figs. 44-46); 1977 (p. 172-174, Fig. 16a-f); 1989 (p.309-311, Fig. 72a-e).

Specimens examined: 15, Incheon: 20, Sosan: 15, Mokpo.

DESCRIPTION

The largest specimen up to 270 mm long and 10 mm wide, and consisted of about 230 setigers. The anterior part of worm yellow-green, the posterior part dark, mixed with black-green pigments. In the dorsal part, the green-brown strips arranged transversely. Anal cirrus has light color.

Prostomium somewhat pearform. Tentacles shorter than palps. Two pairs of rounded eyes in rectangular arrangement, the anterior pair larger and situated at the posterior part of prostomium. The longest peristomial cirrus extends back to the setigers 6-8 (Fig. 2a).

Proboscis has paragnaths on both rings, but the numbers of paragnaths on areas I, V, VI variable among

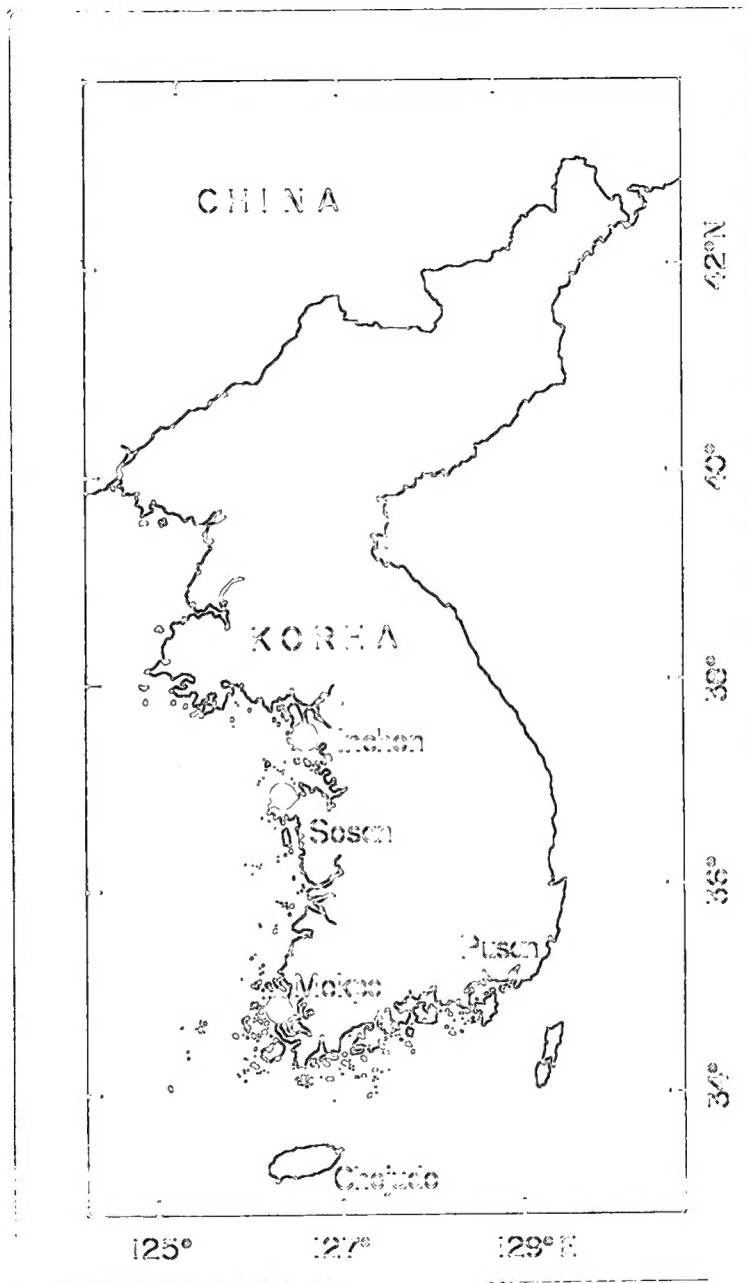


Fig. 1. Collecting localities of *Perinereis aibuhitensis* in the intertidal areas of Korea.

specimens: Area I, 3 or 4 cones (some specimen have 7); II, 12-20 cones in 2-3 rows; III, 40-45 cones in oval cluster; IV, 13-20 cones in 2-3 rows; V, 2 or 3 cones; VI, 2-4 flat triangular cones; VII and VIII have 2 rows (Fig. 2b-c). The jaws have 7 lateral teeth (some specimens have 5-8 teeth).

Except that the first two pairs of parapodia uniramous, all biramous. In anterior parapodium, the superior

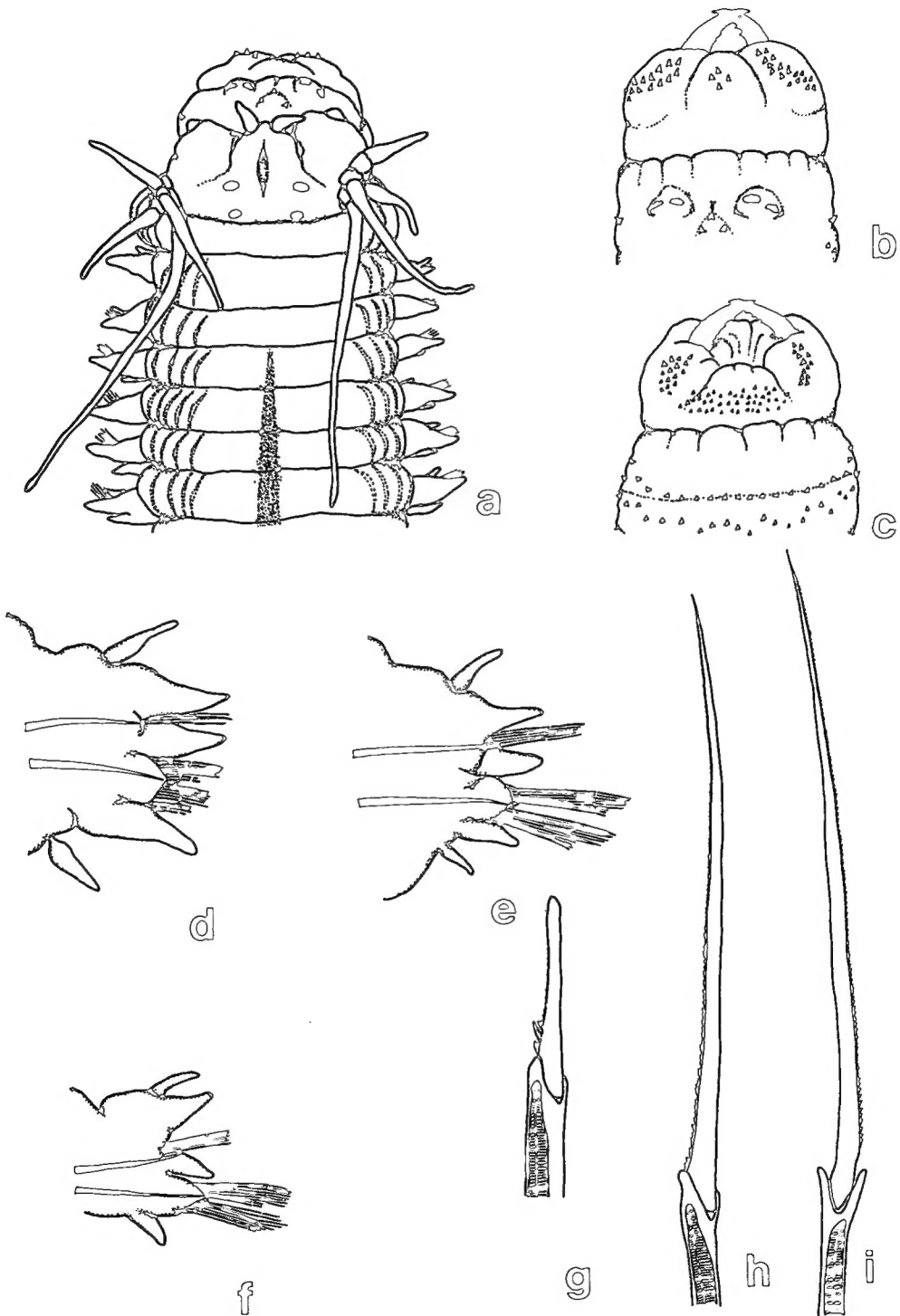


Fig. 2. *Perinereis aibuhitensis*.

a, anterior end in dorsal view; b, proboscis in dorsal view; c, proboscis in ventral view; d, 10th setiger in anterior view; e, 53th setiger in anterior view; f, 139th setiger in anterior view; g, heterogomph falciger; h, heterogomph spiniger; i, homogomph spiniger.

notoligules triangular, the dorsal and ventral cirri palpiform. The dorsal cirrus as long as the superior notoligule but the ventral cirrus short, only half long as the infra-notoligule (Fig. 2d). In middle parapodium, the dorsal cirrus shorter than supra-notoligule. The latter slender and pointed, the infra-notoligule short. The neuropodial lobe bears 2 pre-acicular ligules and one post-acicular ligule, as long as the infra-neuroligule. The ventral cirrus short (Fig. 2e). Posterior parapodium becomes remarkably small, the supra- and infra-notoligules and the neuro-ligule also small, the supra-notoligule protuberant (Fig. 2f).

Notosetae homogomph spinigers throughout (Fig. 2i). The neurosetae homogomph spinigers and heterogomph falcigers in supra-acicular position (Fig. 2g); heterogomph spinigers (Fig. 2h) and falcigers in infra-acicular position.

HETERONEREID

Materials examined: female worms collected at Mokpo intertidal area in Autumn, 1989 reared at room culture bath for 6 months.

Description: Body size 37 mm long and 7.6 mm wide, and consisting of 118 segments. Body color dark green. Prostomium enlarged and palps contracted ventrally. Two pairs of eyes also enlarged, anterior pair larger. Eyes violet. The median of the frontal margin of the prostomium has a vertical straight color band (Fig. 3a). Body largely divided into two parts; each different shape. Anterior part not changed before maturing (atokous region), but posterior one changed to natatory or epitokous form.

In the heteronereids, only ventral setae found from the 11th to the 28th setiger, and after the 89th to the last setiger (Fig. 3b,e). The dorsal and ventral parapodia from the 29th to the 88th setiger enlarged and have natatory setae like peddle shape (Fig. 3d,f). The cirri in the epitokous region thick and have finger-like branches (Fig. 3d).

DISCUSSION

In the identification of nereids, the shape of setae and the arrangement of paragnath on the proboscis are very useful taxonomic characters because they are not changed during fixation. In the case of *Perinereis aibuhitensis*, however, the severe variation in these taxonomic characters leads to confuse the definition and identification of species. For instance, the paragnaths in the area VI look like flat bars or cones according to the observation position and the age of worms, adults or juveniles. Thus this species was mis-identified as *Neanthes virens* owing to the cone shape of area VI paragnaths (IMS, 1977; KORDI, 1989), and also confused with other species such as *Nereis* (*Neanthes*) *linea*, *Nereis* (*Neanthes*) *orientalis*, and *Perinereis vancaurica tetradentata* according to the number of paragnaths in the area VI (Paik, 1975; 1989; Wu et al., 1985). It seems that *N. linea* and *N. orientalis* were not clearly distinguished from *P. aibuhitensis* in China, and in Korea *P. aibuhitensis* was regarded as *P. vancaurica tetradentata* according to the view of Imajima (1972).

The number and arrangement of paragnaths on the proboscis of this species showed so much variation (Table 1). The arrangement of paragnaths in Area II is not clear, and those of *P. vancaurica tetradentata* and *P. aibuhitensis* were not clearly distinguished. The number of paragnaths in Area VI of each species is also similar, and the paragnath rows in Area VII and VIII of these two species may be identical, but

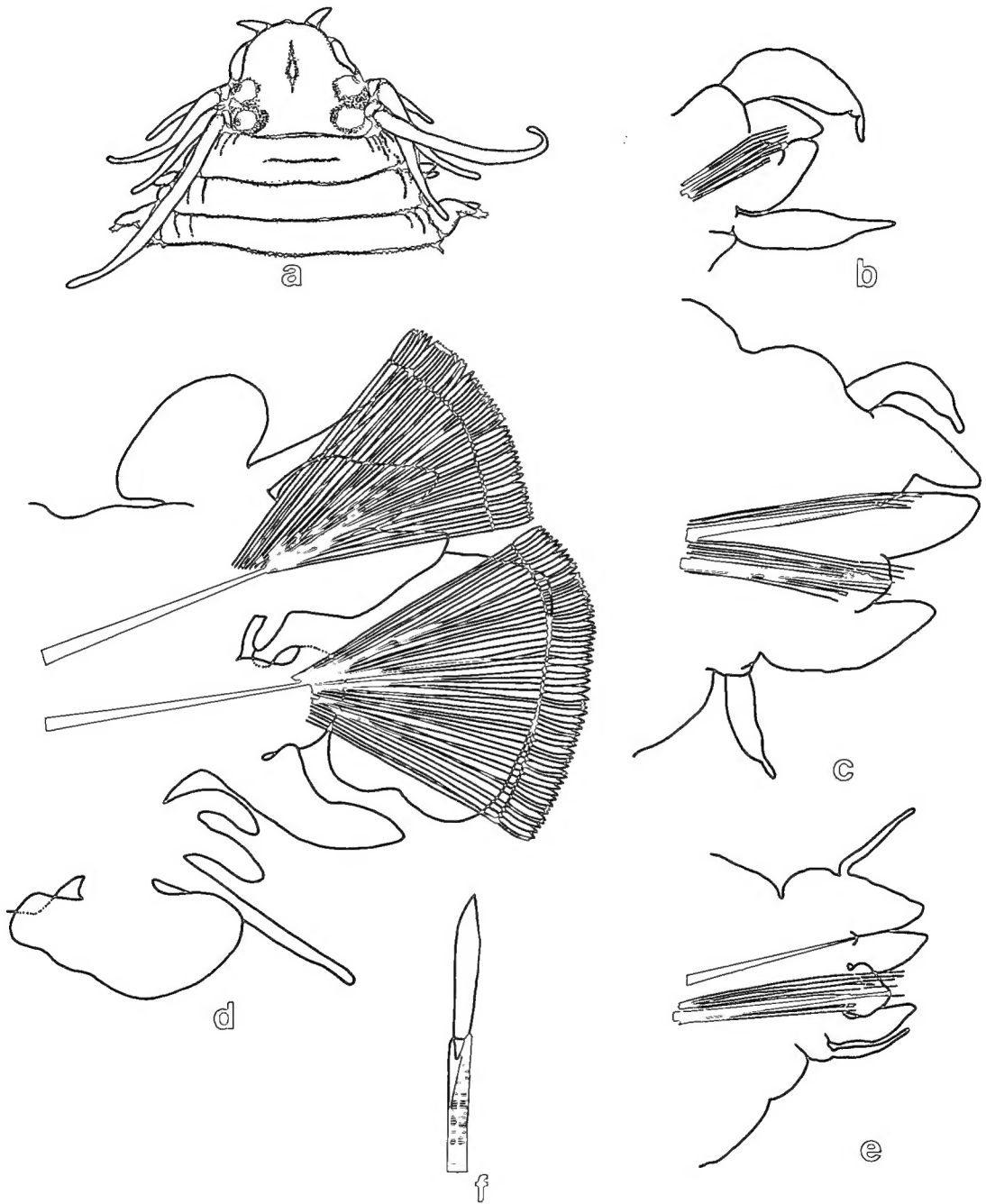


Fig. 3. *Perinereis aibuhitensis*, heteronereid.

a, anterior end in dorsal view; b, 1st setiger in anterior view; c, 11th setiger in anterior view; d, 29th setiger in anterior view; e, 105th setiger in anterior view; f, natatory seta.

Table 1. Variation of paragnath number on proboscis of *Perinereis aibuhitensis*.

Species\Area	I	II	III	IV	V	VI	VII	references
<i>Perinereis</i>	C: 4	C: 19-21	C: 55	C: 23-24	C: 3	T: 2	many (C)	Imajima
<i>vancaurica</i>		in 2 rows		in 3 rows			in 3	(1972)
<i>tetradentata</i>							rows	
"	C: 4	C: 15-17	C: 50	C: 16-21	C: 3	T: 2-3	many (C)	Paik (1977)
		in 2 rows		in 3 rows			in 2 rows	
<i>P. aibuhitensis</i>	C: 2-6	C: 12-29	C: 30-50	C: 18-25	C: 2-4	T: 2-4	"	Wu <i>et al.</i>
	(mainly	in 2 or		in 3-4				(1985)
	2-4)	3 rows		rows				
"	C: 3-4	C: 12-20	C: 40-45	C: 13-20	C: 2-3	T: 2-4	"	Present
		in 2 or 3		in 2-3				study
		rows		rows				

C: Conical paragnath, T: Transverse paragnath

3 rows can be observed if small paragnaths around larger ones are considered as a row (Fig. 2c). Wu *et al.* (1985) also indicated this variation in paragnaths, and they considered two nominal species named by Treadwell (1936) as the junior synonyms of *P. aibuhitensis*. Moreover *P. vancaurica tetradentata* recorded as a subspecies by Imajima (1972) could be questionable because he examined only one specimen which was collected, but not by himself, in the Tokyo estuary in 1908.

The geographical distribution of *P. aibuhitensis* in the northwestern Pacific is concentrated along the coast of the Yellow Sea, that is, Chinese coast and western coast of Korea (Fig. 4). In this paper, we consider *P. vancaurica tetradentata* as synonymous with *P. aibuhitensis*.

ABSTRACT

A nereid worm, *Perinereis aibuhitensis* has been frequently mis-identified in Korea as *P. vancaurica tetradentata* or *Neanthes virens* due to the wide variation in the number and arrangement of paragnaths on its proboscis. In this paper we re-examined ca. 50 worms collected in three intertidal mud flats of the western coast of Korea, and identified them to be *P. aibuhitensis*, a new record in Korea. We also described the heteronereid of this species and its biogeographical range.

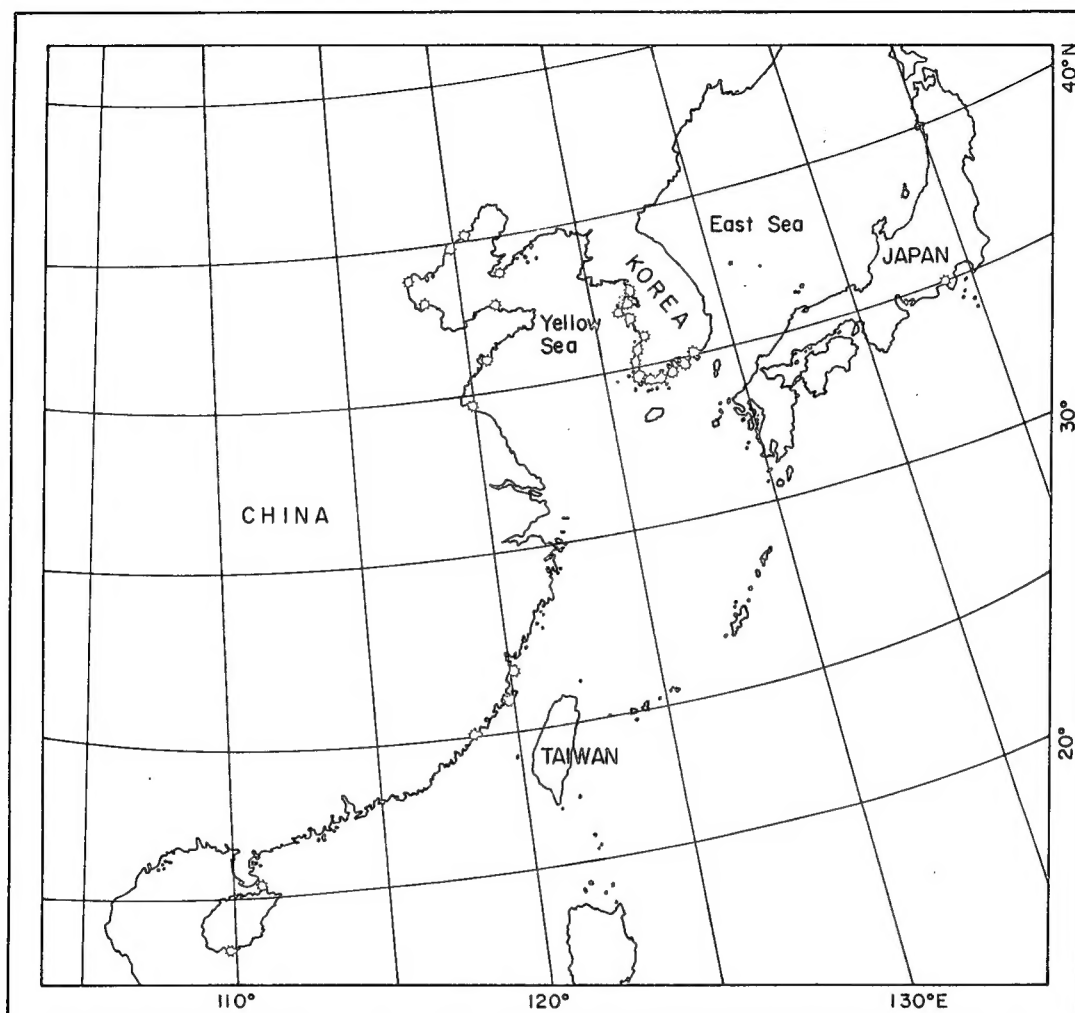


Fig. 4. Geographical distribution of *Perinereis aiubhitensis* in the Yellow Sea and the East China Sea.

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